



Stunting prevention: balanced nutrition education, fill my plate, and complementary food variations for breast milk

Halimatus Sa' diyah¹, Ainassabih Liwani Syarafina², Dzuhri Ananda Firdaus³, Mitra Dwi Murti⁴

¹Department of Psychology Faculty of Psychology, ²Department of Biology, Faculty of Science and Technology, ³Department of Architectural Engineering, Faculty of Science and Technology, ⁴Department of Physics, Faculty of Science and Technology
UIN Maulana Malik Ibrahim Malang
Jl. Kerto Raharjo No. 102, Malang City, East Java, 65145, Indonesia

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ABSTRACT

Optimal nutrition is very important for normal growth and physical and intellectual development of children. One effort to maintain balanced nutrition is to use a "Fill My Plate" meal portion consisting of fifty percent fruit and vegetables, and the remaining fifty percent consisting of carbohydrates and protein. However, there are still very few mothers who understand how to balance the contents of my plate for the nutritional needs of toddlers. The impact is that the stunting rate in Indonesia is still high. One way to prevent stunting is by educating mothers about the contents of my plate and indicators of nutritional adequacy for toddlers. This community service aims to prevent stunting by increasing knowledge about balanced nutrition, what's on my plate, and variations in complementary foods for breast milk (MPASI). The mechanism for implementing this activity consists of four activity steps, namely planning, implementation (providing material, questions and answers, pre and post test questions), activity monitoring, and evaluation. The results of this socialization showed that there was an increase in parents' knowledge of balanced nutrition and variations of MPASI in the good category with the pre-test score which was previously at 51.56 percent, in the post-test it increased to 74.9 percent after the education was provided.

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1. INTRODUCTION

Health Research and Development Agency (2019) stated that the number of children under five experiencing stunting in Indonesia was 7 million (Adelia et al., 2022). Stunting reflects potential disturbances in height growth which can be caused by growth constraints in the womb, malnutrition that hinders development, and disease infections early in life that have an impact on their future (Isnii & Dinni, 2020). Therefore, the process of children's growth and development is greatly influenced by the child's nutritional status (Salim et al., 2021). The importance of a balanced diet for babies and school- aged children is the key to supporting optimal growth and development. According to Baby Led Weaning, in the early stages of life, the role of nutrition is emphasized mainly through breast milk (ASI) and complementary foods (MPASI) (Arias-Ramos et al., 2022). Efforts to increase awareness of balanced

nutrition through effective methods can significantly improve children's health and develop good eating patterns from an early age. This eating pattern is a strategy for regulating the type and amount of food which includes nutrition, preventing and curing disease and maintaining health (Qolbi et al., 2020).

Nutrition is an element that the human body needs to support its growth and development processes. Good nutritional needs are met by various types of food consumed. General guidelines for balanced nutrition state that the food composition required for optimal body function consists of rice, additional ingredients, vegetables and fruit which contain a balanced source of protein from addition ingredients, energy sources from staple foods, minerals and vitamins from vegetables and fruits (Litaay et al., 2021). One method that can be applied to increase children's understanding of a balanced diet is a more visual and interactive approach, where this method not only teaches the nutritional components of food, but also provides practical understanding of the relationship of a balanced diet. One method that has been proven to be effective is "fill my plate" where one meal includes 50 percent of staple foods and side dishes and 50 percent of vegetables and fruit (Wicaksana et al., 2024).

The contents of my plate can be effectively integrated into nutrition education, also related to MPASI proposals. Considering the important role of MPASI in the baby's transition from exclusive breastfeeding to a family diet, it is important for us to study variations in MPASI foods. Different foods not only provide nutritional value but also introduce children to different tastes and textures, thereby forming healthy food preferences from an early age. Consuming sufficient nutrients is very necessary to achieve a good quality of life, maintain health and prevent disease. Certain nutrients also play a special role in supporting the immune system to optimize organ function and protect the body from disease threats (Calder et al., 2020).

According to Hafifa et al. (2023), the eating patterns of families at risk of stunting and pregnant women and toddlers after providing counseling and improving balanced nutrition succeeded in reaching the target. This method allows us to understand how this approach can have a positive impact on children's nutrition, both in terms of quantity and quality of food and how this approach can reduce the risk of nutrition-related health problems. By exploring the relationship between the fill my plate method and variations in MPASI, it is hoped that educational strategies can be developed to help ensure that children receive an adequate and balanced diet that is strong for their health and development. This method not only helps children understand the nutritional value of food but also provides a practical understanding of proportions regarding a balanced diet that not only has an impact on individual health, but also has a broader impact on the development of a quality society (Azwinfadhlan et al., 2023).

An initial survey conducted among the Turen Village community showed that there were still several RWs who had never received socialization or training regarding implementing a balanced diet to prevent the above problems in time. There is still a lack of education regarding germs, especially those related to a balanced diet, therefore there are still many parents who do not understand how to complete a diet, how to prepare a balanced menu, so that their children avoid these problems. Seeing these problems, we feel that to complete a balanced diet it is necessary to carry out socialization and exercise, one of which is eating according to the contents of "Fill My Plate". Therefore, it is hoped that this socialization will be able to provide valuable information for educators, parents and those who shape children's eating habits. Through a better understanding of the Fill My Plate method, it is hoped that positive changes in children's eating behavior can be achieved which will provide a strong foundation for optimal growth and development and can provide a strong foundation for the development of more effective nutrition education programs so that parents and health professionals can easy to implement (Litaay et al., 2021).

2. METHODS

This service method will be carried out on January 17 2024 at 14.00 until finished at Hall RW 09 Turen Village, Turen District, Malang Regency, East Java by providing information to parents about balanced nutrition using the fill my plate method and a variety of complementary foods for breast milk (MPASI). The targets for this activity are parents and toddlers aged 0-23 months. The choice of location was based on extracting information from community service program partners. The proposed solution was to carry out parenting outreach to improve the quality of child rearing patterns in RW 09, Turen Village. The stages of community service program activities include: (1) Planning; (2) Implementation; (3) Monitoring and Evaluation

Planning

The planning process begins by collecting initial information through field surveys to determine partners' needs regarding the development of parenting skills. Then, the PPM activity implementation team makes preparations by developing aims, objectives and design of activity mechanisms, including methods and technical implementation of activities. Socialization and provision to partners was carried out to introduce the program that will be implemented, especially regarding stunting to improve the quality of diet with balanced nutrition and providing good complementary foods from an early age.

Implementation

The method of implementing activities is divided into the following stages: (1) The pre-test is given in the form of a questionnaire to determine the level of knowledge of parents about balanced nutrition and variations in complementary foods for breast milk (MPASI); (2) Socialization about balanced nutrition regarding the method of filling my plate and variations of good and correct complementary foods for breast milk (MPASI) with the presenters, namely representatives of KKM students at UIN Maulana Malik Ibrahim Malang; (3) Discussion and questions and answers regarding balanced nutrition and variations in complementary foods for breast milk (MPASI); (4) Practice proper hand washing to maintain personal hygiene, especially when giving complementary foods to toddlers; (5) Post-test was carried out to obtain information regarding the level of understanding of parents after socialization by giving a questionnaire. The results of pre and post-test measurements are used as a benchmark for providing socialization material by comparing it with previous knowledge.

Monitoring and Evaluation

The next stage is monitoring activities regarding parents' understanding of this activity. Activity evaluations are carried out to provide input on the implementation that has been carried out, so that we can continue to improve and optimize the effectiveness of the programs that have been implemented. After this program is completed, it is hoped that it can increase public knowledge about the "Fill My Plate" GERMAS program and provide good complementary foods for breast milk (MPASI) from an early age as well as provide knowledge to the public on how to maintain eating patterns so that they can change attitudes and behavior according to the contents of my plate and can apply it in everyday life.

3. RESULTS AND DISCUSSION

Results

Activities for submitting stunting prevention materials

Stunting has become a primary focus of the Sustainable Development Goals (SDGs) with the aim of overcoming hunger and malnutrition by 2030, as highlighted by WHO in 2012. Furthermore, stunting is the second key indicator in the SDG of Zero Hunger, targeting a 40% reduction in stunting rates by 2025, as noted by [Mensi & Udenigwe \(2021\)](#). Stunting can be identified based on a child's nutritional status using the PB/U (weight-for-age) or TB/U (height-for-age) index, with measurement results below the threshold (Z-Score) of < -2 SD to -3 SD (short/stunted) and even < -3 SD (very short/severely stunted), according to anthropometric standards ([Fuadah et al., 2023](#)). The factors influencing stunting are multidimensional and have intergenerational impacts. While hereditary factors contribute only 15%, nutritional intake, growth hormones, and recurrent infectious diseases play significant roles, as explained by [Rahayu et al. \(2018\)](#).

The main nutritional problem in Indonesia, namely stunting, has the highest prevalence compared to other nutritional problems, increasing from 27.5 percent in 2016 to 29.6 percent in 2017 ([Kementerian Kesehatan \(Kemenkes\) Republik Indonesia, 2018](#); [Nurhayati et al., 2020](#)). Growth occurs not only after birth, but also in the womb so intervention is needed before and after birth. Nutrition and healthy eating habits are the key to growth, especially for pregnant women. Adequate maternal knowledge regarding nutrition during pregnancy can influence the quality of the child's growth and development ([Adelia et al., 2022](#)). The causes of stunting directly involve a lack of nutritional intake in the body, especially during the first 1000 days of life (HPK), low access to health services, as well as problems with access to clean water and adequate sanitation ([Femelia et al., 2022](#)). This is in accordance with [Margawati & Astuti \(2018\)](#) who state that there are 3 main components in overcoming stunting, including: (1) Stunting is influenced by parents' low knowledge about good eating patterns. The concept of "Fill my plate" A diet must be balanced, where half the portion is filled with fruit and vegetables and half comes from protein sources. A balanced diet with a variety of foods and a clean lifestyle can improve nutritional status. The Ministry of Health carries out various efforts, encourages and provides input on providing baby and child food (IYCF) and breast milk, monitoring children's growth and development, providing blood supplement tablets (TTD) to pregnant women and teenagers and ensuring the community's nutritional needs are met ([Neherta, 2023](#)); (2) Parenting patterns, one of which is the mother's dietary behavior both during pregnancy and early childhood. Starting from pregnant women by providing education on reproductive health, adolescent nutrition and mothers' understanding of the importance of nutrition during pregnancy and four-fold uterine screening during pregnancy. Mothers who give birth in health services should immediately start early breastfeeding (IMD) so that the baby can receive colostrum breast milk (ASI). Apart from that, the World Health Organization (WHO) recommends exclusive breastfeeding until the baby is 6 months old and continued until the age of 2 years by providing nutritious complementary breast milk (MPASI) as well as monitoring the growth and development of small children and providing immunizations according to schedule by taking them to the Posyandu every month ([Asnawati et al., 2019](#)); (3) Good sanitation and access to clean water because it can increase the risk of infection in children. A clean and healthy lifestyle must be adopted, including washing hands with soap and running water and not defecating in the open. Parental education is important to change behavior and improve family nutritional health ([Litaay et al., 2021](#)).

This socialization involves various parties, such as local government, health institutions, schools and local communities. Participants can also follow the activities well from start to finish. Close collaboration

between various parties can increase the effectiveness of the program and reach more people in an effort to improve the quality of children's nutrition. Therefore, the Indonesian Government issued a Balanced Nutrition Guideline in an effort to reduce and maintain the nutritional status of the community. The Ministry of Health's "Fill My Plate" nutritional guidelines provide practical guidance for meeting nutritional needs. Fill My Plate as a slogan that defines how much to eat on one plate at a time (Adelia et al., 2022).

Activities for presenting material and discussion about balanced nutrition using the "Isi Piringku" Method

Balanced nutrition is a diet that meets nutritional needs according to the type and amount needed. If nutrition is not achieved properly in toddlers, the toddler's growth will be disrupted, then the body will be short and thin, and malnutrition can even occur in toddlers (Devriany & Wulandari, 2021). Factors causing malnutrition involve direct aspects such as diet and infectious diseases, as well as indirect aspects such as food security, parenting patterns, health and the environment. Optimal nutrition not only supports physical growth and development, but also has a positive impact on intelligence, work productivity, and protection against chronic disease and premature death. Therefore, improving dietary patterns towards balanced nutritional consumption in society is very necessary to improve individual and community health (Litaay et al., 2021).

Diet has an important impact on a person's and society's health. A balanced diet can be achieved by consuming a variety of foods, adopting a healthy and clean lifestyle, maintaining an ideal body weight, and exercising according to different age groups. A diet that is proportionate to needs and selecting the right ingredients guarantees good nutritional value (Nisak et al., 2023). Even though Indonesia is rich in various types of fruit and vegetables, low consumption can have a negative impact on people's health. Education about nutrition is very important to prevent complex nutritional problems in society, including malnutrition, stunting, obesity and non-communicable diseases (Min et al., 2018).

In accordance with the development of new nutritional science, the guidelines for balanced nutrition, namely 4 healthy 5 perfect, have been changed to "Fill my plate" with the principle of equal rights to obtain food with complete and balanced nutrition, compared to the slogan "4 healthy 5 perfect" which is considered to only prioritize quality or nutritional value alone rather than taking into account the nutritional value (quantity). The contents of my plate aim to increase public understanding regarding balanced nutrition and as a guide to healthy eating patterns which contains 10 messages about nutritional conservation that can help people avoid nutritional problems (Darmawanti, 2022). Of the ten messages, they were grouped into four main messages which include the habit of consuming varied foods, living a clean lifestyle, participating in physical activity, and monitoring body weight normally (Paramita et al., 2022).

My plate consists of staple foods, animal protein, vegetable protein, vegetables and fruit. In the contents of my plate, each component has its own portion, main dishes 2/3 ½ plates, side dishes 1/3 ½ plates, vegetables 2/3 ½ plates and the rest of the fruit (Heryani et al., 2023). Adequate and proper nutrition is the solution to preventing stunting. The level of education, parental knowledge, motivation and participation play an important role in children's understanding of nutrition, so nutrition education is needed as an educational approach. Overcoming nutritional problems must start early, considering the negative impact on individual mental-intellectual growth and development. Therefore, providing food to children, especially young children, must pay attention to the requirements for providing correct food (Widaryanti, 2019).

Activities: Delivery of material on requirements for providing complementary foods for breast milk (MPASI), practice of washing hands to maintain cleanliness before preparing food and giving food to toddlers

In connection with fulfilling balanced nutrition, apart from children up to adulthood. It is important to create healthy eating habits from an early age in babies, because this will build good eating patterns and support their growth and development. For toddlers, there is breastfeeding accompanied by good complementary foods or complementary foods and must comply with the specified conditions, including be on time when MPASI is given when breast milk alone cannot meet the baby's nutritional needs. In addition, babies begin to need additional nutrients (such as iron, zinc, vitamin D, protein and other nutrients), begin to adapt to foods that contain high energy levels, increase the baby's ability to accept a variety of foods with various tastes and shapes as well as chewing and swallowing (Masdarwati, 2023). Therefore, MPASI is given from the age of 6 months, plus the baby's digestive system is more mature and ready to accept solid food.

MPASI is obtained by taking into account the quantity, density, composition/texture/viscosity and variety of food (Adequate). MPASI food choices consist of: First, staple foods include rice, wheat, grains, cassava, corn, sago, tubers, potatoes, and others. Staple foods contain carbohydrates which are really needed to support our daily activities as a source of energy for the body (Cena & Calder, 2020). Second, sources of animal protein include meat, shrimp, chicken, fish, eggs, milk, and their products. In MPASI, giving animal protein is a priority because it contains essential amino acids which are important for the baby's growth and development, as well as iron and zinc which are needed to prevent anemia and support the baby's immune system (Ardiansyah et al., 2022). Fat is obtained through processing processes such as coconut milk, adding oil, and using animal protein in MPASI. Third, sources of vegetable protein found in nuts (vegetable protein): soybeans, beans, peas, peanuts, and others. This source of vegetable and animal protein can help growth and development and increase brain intelligence (Anissa & Dewi, 2021): (1) Fruit and vegetables contain vitamins A and C, tomatoes, oranges, spinach, carrots, mangoes, etc. A balanced portion of vegetables can make skin healthier. Vegetables are rich in vitamin A, a source of vitamin C, iron, minerals, fiber and bioactive substances such as antioxidants. This antioxidant is beneficial for the immune system (Kaparapu et al., 2020). Fruit is a nutritional source that is rich in various vitamins and minerals, including vitamin A, vitamin B and vitamin C which can help strengthen the baby's immune system, fight disease and infection, and protect the baby's body cells from damage caused by radicals free. A combination of fruit and vegetables in your daily diet can provide balanced nutrition and support overall health. Apart from that, continue to provide variations in the types of vegetables and fruit consumed to ensure adequate and varied nutritional intake; (2) Safe, we must pay attention to the cleanliness of food and equipment and wash your hands before giving food to children and before preparing food (Leda et al., 2022); (3) The correct provision of MPASI according to the [Kementerian Kesehatan \(Kemenkes\) Republik Indonesia \(2021\)](#) is MPASI is given regularly (morning, afternoon, evening or night). Providing MPASI regularly helps form good habits in babies, creates a stable routine, and the baby's nutritional needs are met throughout the day. Then, maximum feeding time is 30 minutes. The purpose of limiting the time for giving MPASI is to prevent children from experiencing fatigue. Next, a calm and neutral environment can help children focus on the eating process. Apart from that, don't play or watch TV because it can disturb your child's concentration while eating. Encouraging children to eat with a spoon and drink from a glass can develop their motor skills, help children understand the texture and taste of different foods. By following these guidelines, parents can create positive eating experiences and help children develop healthy eating patterns from an early age.

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Figure 1. Socialization activities participated in by various community figures
Figure 2. Presentation of balanced nutrition material using the Fill My Plate Method
Figure 3. Practice of hand washing by women from RW 09 Turen Village

Discussion

Based on the questionnaire distributed to participants, the results of the questionnaire responses showed that this socialization event was beneficial for the participants. This can be seen from the increase in the percentage of parents' knowledge before and after participating in this socialization. According to Surahman (2018), the criteria for assessing each parent's knowledge and understanding data is in Table 1.

Table. 1 Data classification

Interval (%)	Category
81-100	Very good
61-80	Good
41-60	Enough good
21-40	Not enough good
0-20	Very bad

Based on the results of data processing, a description of the knowledge and understanding of the parents of RW 09, Turen Village, Turen District regarding the balanced nutrition program and variations of MPASI when the pre and post tests are provided with socialization is in Table 2.

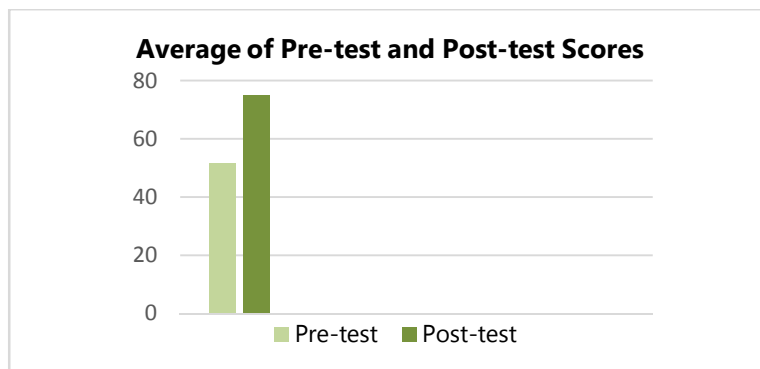


Figure 4. Difference in average pre-test and post-test scores

Table 2. Pre-test and post-test results

Question	Pre-Test (%)	Post-Test (%)	Enhancement (%)
Do you know what balanced nutrition is?	50 (Enough Good)	81.25 (Very Good)	31.25
In your opinion, is implementing a balanced nutrition program important in supporting children's health?	56.25 (Enough Good)	87.5 (Very Good)	31.25
Is it sir/madam pay attention to species diversity foods in daily diet your day?	50 (Enough Good)	75 (Good)	25
Do you know the benefits? From a balanced nutrition program in supporting children's growth?	43.75 (Enough Good)	81.25 (Very Good)	37.5
Did you pay attention? Nutritional information on food labels before consuming it?	43.75 (Enough Good)	62.5 (Good)	18.75
Have you avoid consuming fast food serving or junk food in the routine your children's daily?	50 (Enough Good)	81.25 (Very Good)	31.25
Do you know how to implement the program form balanced nutrition with the fill my plate method?	37.5 (Not enough Good)	75 (Good)	37.5
Do you know factors causing less than optimal nutritional intake for children?	43.75 (Enough Good)	68.75 (Good)	25
To what extent are you involved your family in an effort to look after you balanced diet?	62.5 (Good)	87.5 (Very Good)	25
What are the conditions for giving complementary foods for breast milk (MP breast milk) is good and correct?	37.5 (Not enough Good)	62.5 (Good)	25
Do you know variations of complementary foods for breast milk (MP breast milk) and the importance of maintaining cleanliness?	75 (Good)	93.25 (Very Good)	18.25
Do you have habit of consuming protein sources animal, vegetable protein, carbohydrate, vegetables, and fruit in equal amounts?	68.75 (Good)	81.25 (Very Good)	12.5
How easy is it sir/madam get your access to different types of food to reach balanced nutrition?	81.25 (Very Good)	93.25 (Very Good)	12
Do you feel it is necessary get advice or information more about balanced nutrition?	68.75 (Good)	87.5 (Very Good)	18.75
What is your level of motivation to make internal changes diet to achieve balanced nutrition?	56.25 (Enough Good)	81.25 (Very Good)	25
Mean	51.56	74.9	23.25

Based on Table 2, there was an increase between before and after the delivery of balanced nutrition material with an increase percentage of 23.25 percent. Initially the value was 51.56 percent, but after the presentation of the material it increased to 74.9 percent. Parents in Turen Village who took part in this socialization became more aware of healthy eating patterns with balanced nutrition, as well as the correct requirements for providing breast milk (MPASI). Apart from the pre-test and post-

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test, the presenters also held a question-and-answer session and discussion which received a positive response from parents. This shows that the socialization was successful in increasing the knowledge of parents of activity participants in RW 09 Turen Village. Apart from that, this door prize session received good appreciation from parents who were active in the discussion. The presenters give gifts as a form of appreciation which can be put to good use. Overall, steps to reduce the risk of malnutrition in toddlers can be taken through health education that focuses on preventive and promotional actions. In general, the standard for a balanced food composition is with an energy composition of 50-65 percent carbohydrates, 10-20 percent protein, and 20-30 percent fat. This is in accordance with the Balanced Nutrition Guidelines which contain four basic principles, namely variation in food consumption, regular and measurable physical activity, maintaining personal and environmental cleanliness, and monitoring or maintaining ideal body weight (Ronitawati et al., 2020).

Education through health promotion and nutrition interventions can also be strengthened by evaluating knowledge, attitudes and behavior to measure the impact of interventions on increasing understanding and practice of nutrition. Lestari (2022) state that education and health promotion in the field of nutrition can be optimal in reducing the risk of malnutrition through prevention from preventive and promotive aspects, including providing direct practices and interventions to related parties such as mothers, Posyandu cadres and PAUD teachers. According to Al Maududi (2022), his research also explains that community service activities such as socialization about the management of exclusive breastfeeding and MP-ASI have succeeded in attracting the interest of pregnant women, breastfeeding mothers and mothers who have babies or toddlers to increase understanding about the importance of providing exclusive breast milk and MP-ASI to their children. This is reflected in the difference in the percentage of pre-test and posttest answers before or after the socialization was carried out which showed a significant increase. Apart from that, all participants actively participated in interactions with the speakers from the beginning to the end of the activity.

4. CONCLUSION AND RECOMMENDATIONS

Stunting prevention using an innovative method consisting of a balanced nutrition education approach using the 'Fill My Plate' method and a variety of complementary breast milk foods (MPASI) has proven to be effective as a practical tool in providing nutrition education to mothers. By providing a simple visual guide, this method makes it easier to understand how to prepare a balanced diet, paving the way for increased understanding of nutrition at the household level. Diversification of complementary foods for breast milk is a key factor in preventing stunting. Emphasis on the concept of diversity provides a more complete nutritional intake, supports optimal growth and development in children, and reduces the risk of nutritional deficiencies. Based on data from pre and post-test observations, it is known that there was an increase between before counseling and the quite good category (51.56 percent) and increasing to the good category (74.9 percent). This happened after presenting material on balanced nutrition using the fill my plate method and introducing a diversity of complementary foods for breast milk.

There needs to be socialization and promotion regarding the "Fill My Plate" GERMAS program. Because, these two methods provide a concrete basis for efforts to prevent stunting and become a solid basis for making better decisions regarding children's diets, especially toddlers. The education provided is not only informative but also provides practical guidance that can be applied in everyday life and ensures sustainable nutritional improvements. The description of the innovative 'Fill My Plate' method and diversification of complementary foods for breast milk is not only a nutrition education strategy, but also a concrete and measurable step in preventing stunting, which is a serious public health

challenge. We suggest that similar activities can continue to be carried out using more innovative media in order to increase public interest in supporting the important program to fulfill children's nutrition. It is also recommended that this activity can be made into a sustainable program by the local Posyandu targeting not only mothers but also fathers to provide motivation and support in providing exclusive breastfeeding and MPASI so that the problem of stunting in Indonesia can be overcome gradually.

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